

# VACUUM CLEANER

## BACKGROUND OF THE INVENTION

### 5           1.       Field of the Invention

The present invention relates to a vacuum cleaner, and in particular to a vacuum cleaner used for blowing dirt or debris lay on curtains or window frames as well as for suctioning those on the surface to be cleaned.

### 10           2.       Description of the Related Art

In general, a vacuum cleaner is an electric home appliance for cleaning an indoor space of a house or a building or a car. It is possible to remove impurities such as dust by using a vacuum suction force of the vacuum cleaner.

Figure 1 is a perspective view illustrating the conventional vacuum cleaner, and Figure 2 is a plane view illustrating a main body of the conventional vacuum cleaner.

As depicted in Figures 1 and 2, the vacuum cleaner includes a main body 1 having a suction fan for generating a suction force; a flexible hose 2 connected to the front of the main body 1 to guide impurities sucked from a surface to be cleaned; a handle 3 combined with an end of the flexible hose 2 so as to have a selection mode for selecting a cleaning mode by a user; an extended pipe 4 extended-combined with the other end of the handle 3; and a head unit 5 combined with the end of the extended pipe 4 in order to suck impurities on a surface to be cleaned.

25           The main body 1 of the vacuum cleaner includes a casing 1a for forming

an external shape and an internal space; a suction force generating unit 1b having a suction fan installed at a side of the casing 1a and a motor; a filter unit 1c installed at the other side of the casing 1a so as to have a filter; a suction pipe 1d for connecting the flexible hose 2 to a side of the filter unit 1c and guiding impurities sucked into the flexible hose 2 into the filter unit 1c; a guide pipe 1e for connecting the filter unit 1c with the suction force generating unit 1b and guiding air passed the filter unit 1c into the suction force generating unit 1b; and a discharge pipe 1f connected to the suction force generating unit 1b to discharge air passed the filter unit 1c to the outside.

The operation of the conventional vacuum cleaner will be described.

First, when a user applies power to the vacuum cleaner and selects a cleaning mode with the selection mode on the handle 3, a suction force is generated by the suction force generating unit 1b, and accordingly the user performs cleaning by holding the handle 3 and moving the head unit 5 back-force and left-right. Herein, impurities on the bottom surface are sucked through a nozzle (not shown) of the head unit 5, pass the extended pipe 4 and flexible hose 2 and are filtered by the filter unit 1c connected to the suction pipe 1d. The filtered air passes the guide pipe 1e and the suction force generating unit 1b and is discharged to the outside through a discharge hole D formed at a side of the discharge pipe 1f and the casing 1a.

Because the conventional vacuum cleaner has a function only for sucking impurities on the bottom surface by using a suction force, in case of shaking the dust off a window frame and brushing up the dust on a fabric such as a curtain or when it is difficult to clean because a fabric is stuck on the head unit of the vacuum cleaner, there are some problems to clean.

## SUMMARY OF THE INVENTION

In order to solve the above-mentioned problems, it is an object of the present invention to provide a vacuum cleaner capable of performing not only a suction cleaning but also a blow cleaning.

In order to achieve the above-mentioned object, a vacuum cleaner in accordance with the present invention includes a casing having a certain internal space; a suction force generating unit installed in the casing so as to generate a suction force; a head unit connected with the casing so as to have cleaning implement and provide a flow channel for removing impurities outside; a filter unit installed in the casing for filtering off impurities in air sucked from the outside; a flow channel switch means installed in the casing for selectively switching a flow channel of air flowing through among the head unit, the filter unit and the suction force generating unit; and plural pipes for providing passages of air flowing in the head unit, the filter unit, the suction force generating unit and the flow channel switch means.

A vacuum cleaner in accordance with the present invention includes a casing having a certain internal space; a suction force generating unit installed in the casing to generate a suction force and discharge sucked air; a head unit combined with the casing to suck impurities on the bottom with air by a suction force of the suction force generating unit or discharge ambient air sucked from the outside; a filter unit for filtering off impurities in air sucked through the head unit or ambient air received from the outside; a flow channel switch means connected with the head unit, the filter unit and the suction force generating unit so as to

selectively switch a flow channel for guiding air including impurities sucked in through the head unit by the suction force of the suction force generating unit or making ambient air introduced in the flow channel switch means flow to the head unit; and plural pipes for providing passages of air flowing through among the head unit, the filter unit, the suction force generating unit and the flow channel switch means.

## BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and together with the description serve to explain the principles of the invention.

In the drawings:

Figure 1 is a perspective view illustrating the conventional vacuum cleaner;

Figure 2 is a sectional-plane view illustrating part of a main body of the conventional vacuum cleaner;

Figure 3 is a perspective view illustrating part of a main body of a vacuum cleaner in accordance with the present invention;

Figure 4 is an exploded-perspective view illustrating a flow channel switch means of the vacuum cleaner in accordance with the present invention;

Figure 5A is a perspective view illustrating a suction mode of the vacuum cleaner in accordance with the present invention; and

Figure 5B is a perspective view illustrating a blow mode of the vacuum

cleaner in accordance with the present invention.

## DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

5 Hereinafter, the preferred embodiment of a vacuum cleaner in accordance with the present invention will be described in detail.

Same part with those of the conventional art will have the same reference numerals.

Figure 3 is a perspective view illustrating a main body of a vacuum cleaner  
10 in accordance with the present invention, Figure 4 is an exploded-perspective view illustrating a flow channel switch means of the vacuum cleaner in accordance with the present invention, Figure 5A is a perspective view illustrating a suction mode of the vacuum cleaner in accordance with the present invention, and Figure 5B is a perspective view illustrating a blow mode of the vacuum cleaner in accordance  
15 with the present invention.

As depicted in Figures 3 ~ 5B, a main body 10 of a vacuum cleaner in accordance with the present invention includes a casing 11 for forming a certain internal space; a suction force generating unit 13 installed at a side of the casing 11 to generate a suction force; a filter unit 12 installed at a side of the suction force  
20 generating unit 13 so as to be connected with the suction force generating unit 13 and have a filter (not shown) for separating impurities from the sucked air; and a flow channel switch means 20 for connecting the head unit 5 with the filter unit 12 or the suction force generating unit 13 selectively.

In order to make air flow the construction parts of the main body 10,  
25 following plural pipes are connected.

A main inflow pipe 15 is connected between the filter unit 12 and the flow channel switch means 20 in order to make air and impurities flow into the filter unit 12, and a guide pipe 16 is connected between the filter unit 12 and the suction force generating unit 13 in order to guide the air filtered through the filter unit 12 to the suction force generating unit 13. A main discharge pipe 17 is connected to a side of the suction force generating unit 13 in order to discharge the air from the suction force generating unit 13 to the outside, and a sub-discharge pipe 18 is connected between the main discharge pipe 17 and the flow channel switch means 20 in order to make part of air discharged to the outside through the main discharge pipe 17 diverge from the main discharge pipe 17 and flow to the flow channel switch means 20.

The flow channel switch means 20 includes a valve housing 21 fixed-installed to the casing 11; and a flow channel switch valve 22 rotatively combined with the valve housing 21 so as to convert a flow direction of a fluid.

The valve housing 21 is a cylinder having a certain height, and it includes a first through hole 21a connected to the head unit 5 through a head unit connecting pipe 14 and a second through hole 21b formed so as to be horizontal to the first through hole 21a along the circumference and be at an interval of 90 degrees, herein, the second through hole 21b is connected to the main inflow pipe 15. In addition, the valve housing 21 further includes a third through hole 21c formed so as to be horizontal to the second through hole 21b along the circumference and be at an interval of 180 degrees, herein, the third through hole 21c is connected to the sub-discharge pipe 18.

The flow channel switch means 22 has a circular-bar shape so as to be inserted into a valve housing 21, and it includes a first flow channel 22a for

connecting a first through hole 21a with a second through hole 21b or the third through hole 21c of the valve housing 21 selectively; and a second flow channel 22b penetrating the first flow channel 22a in the vertical direction. When the first flow channel 22a connects the first through hole 21a with the second through hole 21b, the second flow channel 22b is cut off by the valve housing 21. On the contrary, when the first flow channel 22a connects the first through hole 21a with the third through hole 21c, the second flow channel 22b directly connects ambient air to the second through hole 21b.

Herein, the first through hole 23a and the second through hole 23b respectively formed at both ends of the first flow channel 22a are formed so as to be horizontal along the circumference and at an interval of 90 degrees. In the second flow channel 22b, the third through hole 24a is formed so as to be separated from the first through hole 23a at an interval of 180 degrees along the circumference, and the fourth through hole 24b is formed on the top surface of the flow channel switch valve 22 so as to be exposed to the outside.

In addition, a valve knob 26 is formed on the top surface of the flow channel switch valve 22 so as to be exposed to the outside of the casing 11 of the main body 10 together with the fourth through hole 24b in order to make the user adjust the flow channel switch valve 22 easily. The valve knob 26 can be projected-formed on the top surface of the flow channel switch valve 22 so as to have a certain length and width or can be formed as various shapes.

In another embodiment of the present invention, by installing an additional electronic device, it is possible to adjust the flow channel switch valve 22 automatically.

The operation of the vacuum cleaner in accordance with the present

invention will be described.

First, in order to perform a general suction cleaning mode, as depicted in Figure 5a, when the user holds the handle 3 (shown in Figure 1), applies power to the main body 10 and switches the flow channel switch valve 22 to make the head unit 5 (shown in Figure 1) connect with the filter 12 through the first flow channel 22a of the flow channel switch valve 22.

Herein, by the suction force of the suction force generating unit 13, sucked air and impurities on the surface (to be cleaned) are sucked into the filter unit 12 by passing the head unit 5, the extended pipe 4 (shown in figure 1), the flexible hose 2 (shown in Figure 1), the head unit connecting pipe 14, the first flow channel 22a and the main inflow pipe 15. In the filter unit 12, the impurities are separated from the air by the filter 12, the impurities are contained in a storage of the filter unit 12, however, the air is discharged to the outside of the casing 10 through the guide pipe 16 and the main discharge pipe 17. Herein, the sub-discharge pipe 18 diverged from the main discharge pipe 17 is closed by the flow channel switch valve 22, and accordingly air through the main discharge pipe 17 is discharged to the outside of the casing 11 of the main body 10.

In the meantime, in order to perform the blow cleaning mode by using the cleaner in accordance with the present invention, as depicted in Figure 5b, the user switches the flow channel switch valve 22 switches to the blow cleaning mode in order to connect the head unit 5 with the main discharge pipe 17 through the first flow channel 22a and the sub-discharge pipe 18.

Herein, by connecting the third through hole 24a at the outlet side of the second flow channel with the filter unit 12 through the main inflow pipe 15, ambient air flows into the filter unit 12 through the second flow channel 22b and the main



inflow pipe 15 by the suction force generated by the suction force generating unit 13, the air in the filter unit 12 flows to the suction force generating unit 13 through the guide pipe 16, part of the air is discharged to the outside of the casing 11 through the main discharge pipe 17 or the rest is discharged to the first flow channel 22a through the sub-discharge pipe 18. The air in the first flow channel 22a blows dust on a window frame or a recess while being discharged through the head unit 5.

As described-above, in the vacuum cleaner in accordance with the present invention, by installing a flow channel switch means for switching an air flow channel among the head unit, the filter unit and the sub-discharge pipes of the suction force generating unit, it is possible to remove impurities such as dust by shaking the dust off with heavy wind, and accordingly usability of the vacuum cleaner can be improved greatly.

In addition, by using the same hose as it is, it is possible to simplify a construction of the vacuum cleaner and facilitate a cleaning operation. And, it is possible to reduce an additional cost, minimize increase of a production cost and diversify vacuum cleaner's functions.